

Although in the previous embodiments matching of image patches has been described based solely on a transform for accounting for different relative orientations of a portion of a patient being matched, it will be appreciated that additionally, factors such as variation in relative lighting and differences in gain for different cameras or other image sensors, could also be taken into account when processing data to match patches. The processing to account for such variation would be entirely conventional.

Although in the first embodiment a system has been described in which patches are matched by recalculating iterative transforms from the difference between patch values at different iterations, it will be appreciated that transform values could be determined in a conventional way by updating both the difference matrix and the derivative matrix for patches at each iteration.

In the first embodiment, matching a generated model surface with a stored surface is described as being a two stage process. Initially a rough match is achieved utilising a decimated stored model and a sub sample of points from the generated model. An accurate match is then achieved using the rough match and a complete model of the surface. The advantage of such a system is that the decimated surface and sub sampled points can be aligned relatively quickly. A final fine match can then also be achieved quickly as since the surfaces will be already roughly aligned only relatively small search volumes need to be considered for generating the final match.

Although in the first embodiment a rough match based on decimated models is described, other methods could be used. Thus for example instead of generating an initial rough match on a decimated surface, where a greater density of points are allocated for portions of a model representative of curved surfaces a simple lower resolution subsampled triangulation of a model surface could be used to calculate the initial rough match. Although such a system would not generate quite such an accurate initial transformation, this would not matter as a final fine match could still be achieved using the full model. Using a lower resolution model would however have the advantage that the model could be more easily and therefore rapidly calculated. One way of generating such a lower resolution model would be to generate triangulation based on a sub sample of points from the original images used to generate the stored model.